

-49-

CLAIMS

1. A processor-based method for determining whether to deliver or to withhold a cardiac rhythm management therapy in response to the occurrence of atrial and ventricular events, comprising, in a dual chamber implantable pulse generator:
 - sensing cardiac depolarization events;
 - determining a cardiac grammar based on the sensed events for a plurality of cardiac cycles;
 - applying a priority-rule based logic set to the cardiac grammar to determine if each clause of a plurality of rules of said priority-rule based logic set is firing; and
 - withholding a therapy or delivering the cardiac rhythm management based on a highest priority rule of the priority-rule based logic for which all clauses are firing.
2. A method according to claim 1, wherein the cardiac depolarization events comprise a plurality of atrial-based events and a plurality of ventricular-based events.
3. A method according to claim 1, wherein the cardiac rhythm management therapy includes at least a one of:
 - an atrial anti-arrhythmia-only therapy;
 - a ventricular anti-arrhythmia-only therapy;
 - a cardioversion therapy;
 - a defibrillation therapy;
 - an anti-tachycardia pacing therapy;
 - an anti-arrhythmia therapy.
4. A method according to claim 3, wherein the anti-arrhythmia therapy comprises a one of:

-50-

a nerve stimulation therapy; or
a drug administration therapy.

5. A method according to claim 3, wherein the anti-tachycardia pacing therapy further comprises:

a plurality of anti-tachycardia pacing therapies, wherein each one of said plurality of anti-tachycardia pacing therapies having a different operating parameter than the other of said anti-tachycardia pacing therapies

6. A method according to claim 3, wherein the defibrillation therapy further comprises:

a plurality of defibrillation therapies, wherein each of said plurality of defibrillation therapies is programmed to deliver a different amount of defibrillation energy.

7. A method according to claim 3, wherein the cardioversion therapy further comprises:

a plurality of cardioversion therapies, wherein each of said plurality of cardioversion therapies is programmed to deliver a different amount of cardioversion energy.

8. A method according to claim 6, further comprising:

in the event that a first defibrillation therapy does not terminate an arrhythmia, reconfirming the presence of an arrhythmia wherein defibrillation is an appropriate anti-arrhythmia therapy; and

delivering an increased-energy defibrillation therapy, wherein said increased-energy defibrillation therapy comprises a one of the plurality of defibrillation therapies.

9. A method according to claim 6, further comprising:

-51-

in the event that a first cardioversion therapy does not terminate an arrhythmia, reconfirming the presence of an arrhythmia wherein cardioversion is an appropriate anti-arrhythmia therapy; and

delivering an increased-energy cardioversion therapy, wherein said increased-energy cardioversion therapy comprises a one of the plurality of cardioversion therapies.

10. A computer readable media for storing instructions for determining whether to deliver or to withhold a cardiac rhythm management therapy in response to the occurrence of atrial and ventricular events, comprising, in a dual chamber implantable pulse generator:

instructions for sensing cardiac depolarization events;
instructions for determining a cardiac grammar based on the sensed events for a plurality of cardiac cycles;

instructions for applying a priority-rule based logic set to the cardiac grammar to determine if each clause of a plurality of rules of said priority-rule based logic set is firing; and

instructions for withholding a therapy or delivering the cardiac rhythm management based on a highest priority rule of the priority-rule based logic for which all clauses are firing.

11. A medium according to claim 10, wherein the cardiac depolarization events comprise a plurality of atrial-based events and a plurality of ventricular-based events.

12. A medium according to claim 10, wherein the cardiac rhythm management therapy includes at least a one of:

an atrial anti-arrhythmia-only therapy;
a ventricular anti-arrhythmia-only therapy;
a cardioversion therapy;

-52-

a defibrillation therapy;
an anti-tachycardia pacing therapy;
an anti-arrhythmia therapy.

13. A medium according to claim 12, wherein the anti-arrhythmia therapy comprises a one of:

a nerve stimulation therapy; or
a drug administration therapy.

14. A medium according to claim 12, wherein the anti-tachycardia pacing therapy further comprises:

a plurality of anti-tachycardia pacing therapies, wherein each one of said plurality of anti-tachycardia pacing therapies having a different operating parameter than the other of said anti-tachycardia pacing therapies.

15. A system for determining whether to deliver or to withhold a cardiac rhythm management therapy in response to the occurrence of atrial and ventricular events, comprising, in a dual chamber implantable pulse generator:

means for sensing cardiac depolarization events;

means for determining a cardiac grammar based on the sensed events for a plurality of cardiac cycles;

means for applying a priority-rule based logic set to the cardiac grammar to determine if each clause of a plurality of rules of said priority-rule based logic set is firing; and

means for withholding a therapy or delivering the cardiac rhythm management based on a highest priority rule of the priority-rule based logic for which all clauses are firing.

-53-

16. A system according to claim 15, wherein the cardiac depolarization events comprise a plurality of atrial-based events and a plurality of ventricular-based events.

17. A system according to claim 15, wherein the cardiac rhythm management therapy includes at least a one of:

- an atrial anti-arrhythmia-only therapy;
- a ventricular anti-arrhythmia-only therapy;
- a cardioversion therapy;
- a defibrillation therapy;
- an anti-tachycardia pacing therapy;
- an anti-arrhythmia therapy.

18. A system according to claim 17, wherein the anti-arrhythmia therapy comprises a one of:

- a nerve stimulation therapy; or
- a drug administration therapy.

19. A system according to claim 17, wherein the anti-tachycardia pacing therapy further comprises a plurality of anti-tachycardia pacing therapies, wherein each one of said plurality of anti-tachycardia pacing therapies having a different operating parameter than the other of said anti-tachycardia pacing therapies.